



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,688	02/10/2004	Heikki Kuisma	59244.00010	7386
32294	7590	11/17/2004	EXAMINER	
SQUIRE, SANDERS & DEMPSEY L.L.P.			BELLAMY, TAMIKO D	
14TH FLOOR			ART UNIT	
8000 TOWERS CRESCENT			PAPER NUMBER	
TYSONS CORNER, VA 22182			2856	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/774,688

Applicant(s)

KUISMA ET AL.

Examiner

Tamiko D. Bellamy

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 is/are rejected.
7) ☒ Claim(s) 14 and 15 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/7/04 and 9/3/04.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmiesing et al. (6,318,174) in view of Hetrick et al. (6,404,028).

Re to claim 1, Schmiesing et al. discloses a movable electrode (e.g., movable electrode 120 including fingers 122, 123), and a stationary electrode (170). As depicted in fig. 1, Schmiesing et al. also discloses protrusions (125,171) on both a movable electrode (e.g., movable electrode 120 including fingers 122, 123) and the stationary electrode (170). Schmiesing et al. does not specifically disclose that the protrusions are coated with a diamond-like coating. Hetrick et al. teaches the use of a diamond-like coating (e.g., amorphous hydrogenated carbon 42) (see col. 3, lines 12-29) on microelectromechanical structure to prevent the sticking of the microelectromechanical structure, which includes a movable mechanical microstructure, used in sensors (col. 2, lines 48-52). Therefore, to modify Schmiesing et al. by employing protrusions coated with a diamond like coating would have been obvious to one of ordinary skill in the art at the time of the invention since Hetrick et al. teaches an acceleration sensor for having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Schmiesing et al. and Hetrick et al. since Schmiesing et

al. states that his invention is applicable to an acceleration sensor including a cantilevered movable and fixed electrodes and Hetrick et al. is directed to using a diamond like coating to coat an acceleration sensor that includes a movable cantilever structure (40) and a fixed electrode (e.g., bottom electrode 32).

Re to claims 2-4, Schmiesing et al. discloses an isolation protrusion(s) (125, 171). Schmiesing et al. lacks the detail of two-layer composite structure including a base layer and top layer of diamond like coating. Hetrick et al. teaches the use of a diamond-like coating (e.g., amorphous hydrogenated carbon 42) (see col. 3, lines 12-29) on microelectromechanical structure to prevent the sticking of the microstructure, which includes a movable mechanical microstructure, used in sensors (col. 2, lines 48-52). As depicted in fig. 1, Hetrick et al. a two-layer composite structure. Re to the further limitation of claims 3 and 4, Hetrick et al. discloses the diamond like coating (42) extends on the sides of the stationary electrode (e.g., bottom electrode 32). Therefore, to modify Schmiesing et al. by employing protrusions coated with a diamond like coating would have been obvious to one of ordinary skill in the art at the time of the invention since Hetrick et al. teaches an acceleration sensor for having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Schmiesing et al. and Hetrick et al. since Schmiesing et al. states that his invention is applicable to an acceleration sensor including a cantilevered movable and fixed electrodes and Hetrick et al. is directed to using a diamond like coating to coat an acceleration sensor that includes a movable cantilever structure (40) and a fixed electrode (e.g., bottom electrode 32).

Re to claim 5, Schmiesing et al. discloses a protrusions (125, 171) having a base layer. Schmiesing et al. lacks the detail of the base layer being thicker than the top layer. As depicted in fig. 1, Hetrick et al. a base layer (28) attached to of the fixed electrode (32) that is thicker than the top layer of diamond like coating (e.g., amorphous hydrogenated carbon 42). Therefore, to modify Schmiesing et al. by employing base layer thicker than a top layer would have been obvious to one of ordinary skill in the art at the time of the invention since Hetrick et al. teaches an acceleration sensor for having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Schmiesing et al. and Hetrick et al. since Schmiesing et al. states that his invention is applicable to an acceleration sensor including a cantilevered movable and fixed electrodes and Hetrick et al. is directed to using a diamond like coating to coat an acceleration sensor that includes a movable cantilever structure (40) and a fixed electrode (e.g., bottom electrode 32).

Re to claim 6, Schmiesing et al. discloses that the protrusions (125, 171), and that a sacrificial layers (600, 620) are comprised of silicon dioxide (col. 6, lines 50-53). Schmiesing et al. also discloses that the layers (600, 620) are removed to release the beam (140), the fingers (122) and the body (121) of movable electrode (120) (col. 6, lines 45-47). As depicted in fig.1, the protrusions (125, 171 are also made silicon dioxide. Therefore, Schmiesing et al. has protrusions that include a base layer consisting of oxide.

Re to claim 7, as depicted in fig. 1, Schmiesing et al. discloses a plurality of protrusions (125, 171).

Re to claims 8 and 10, as depicted in fig. 1, Schmiesing et al. discloses protrusions (125) on both sides of the movable electrode (movable electrode 120 including fingers 122, 123).

Re to claim 9, as depicted in fig. 1, Schmiesing et al. discloses protrusions (171) on the stationary electrode (170).

Re to claims 11-13, Schmiesing et al. discloses protrusions (125, 171). Schmiesing et al. lacks the detail of a diamond like coating on the protrusions that are grown by ion beam, plasma enhanced chemical vapor, or arch discharge disposition. Hetrick et al. teaches the use of a diamond-like coating (e.g., amorphous hydrogenated carbon 42) (see col. 3, lines 12-29) on microelectromechanical structure to prevent the sticking of the microelectromechanical structure that includes a movable mechanical microstructure used in sensors (col. 2, lines 48-52). Hetrick et al. also teaches that the coating can be applied by various techniques such as by ion beam deposition, plasma-assisted chemical vapor deposition, and arch discharge. Therefore, to modify Schmiesing et al. by employing on a coating grown by ion beam, plasma enhanced chemical vapor, or arch discharge disposition would have been obvious to one of ordinary skill in the art at the time of the invention since Hetrick et al. teaches an acceleration sensor for having these design characteristics. The skilled artisan would be motivated to combine the teachings of Schmiesing et al. and Hetrick et al. since Schmiesing et al. states that his invention is applicable to an acceleration sensor including a cantilevered movable and fixed electrodes and Hetrick et al. is directed to using a diamond like coating to coat an acceleration

Art Unit: 2856

sensor that includes a movable cantilever structure (40) and a fixed electrode (e.g., bottom electrode 32).

Allowable Subject Matter

3. Claims 14 and 15 are objected to as being dependent upon a rejected base claim 1, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (571) 272-2190. The examiner can normally be reached on Monday - Friday 6:30 AM to 12:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

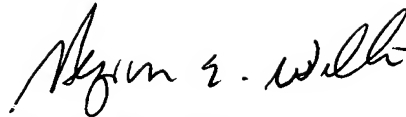
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 2856

Tamiko Bellamy

T.B.

November 15, 2004

A handwritten signature in cursive script, appearing to read "Hezron Williams", followed by a long horizontal line extending to the right.

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800